



**Response under 37 C.F.R. 1.116
- Expedited Examining Procedure -
Examining Group 1752**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Lilia P. Burleva, et al

METHOD FOR CHEMICAL
SENSITIZATION OF SILVER
HALIDE FOR
PHOTOTHERMOGRAPHIC USE

Serial No. 10/731,680

Filed 09 December 2003

Group Art Unit: 1752

Examiner: Chea, Thorl

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Sherry A. Payne


October 26, 2005

Date

Commissioner for Patents
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Sir:

PRE-APPEAL BRIEF REQUEST FOR REVIEW

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Photothermographic materials are constantly being redesigned to meet ever-increasing demands for increased photospeed without a significant increase in fog (D_{min}) or a loss in D_{max}. Applicants' claimed invention meets that need with a method for preparing a photothermographic emulsion and material using a unique order of steps. Defined diphenylphosphine sulfide compounds are used in preferred embodiments. The claimed method includes:

- A) providing a photothermographic dispersion of preformed photosensitive silver halide grains and a non-photosensitive source of reducible silver ions,
- B-1) providing an organic sulfur-containing compound in association with the preformed photosensitive silver halide grains and non-photosensitive source of reducible silver ions in the dispersion of step A),
- B-2) converting some of the reducible silver ions into photosensitive silver halide grains (e.g. "*in-situ*" photosensitive silver halide grains), and then
- C) chemically sensitizing at least the preformed photosensitive silver halide grains by decomposing the diphenylphosphine sulfide on or around the preformed and *in-situ* photosensitive silver halide grains in an oxidative environment to provide chemically sensitized preformed and *in-situ* photosensitive silver halide grains in association with the remaining non-photosensitive source of reducible silver ions.

Steps B-1 and B-2 are always performed before Step C.

The claimed method is not taught in the art (e.g. Winslow et al.).

The unpatentability rejection of Claims 1-4, 9-15, and 23-27 under 35 U.S.C. §103(a) over the combination of U.S. Patent 5,891,615 (Winslow et al.), U.S. Patent 6,274,297 (Uytterhoeven et al.), and U.S. Patent 3,457,075 (Morgan et al.) is in error.

(1) Winslow et al. and Morgan et al. are not properly combined.

Applicants agree that Winslow et al. teaches a useful method for chemical sensitization by decomposing sulfur-containing dyes onto preformed silver halide grains. However, Winslow et al. fails to teach the importance of timing in the overall process for preparing *in-situ* grains. There is no mention of preparing a dispersion of both preformed silver halide grains and *in-situ* silver halide grains before chemical sensitization as required by the present invention.

Morgan et al. describes the formation of *in-situ* photosensitive silver halide grains to prepare photothermographic materials. However, Morgan et al. does not suggest chemical sensitization for photothermographic emulsions at any time, whether before or after formation of *in-situ* photosensitive silver halide grains. Since Morgan et al. is limited to *in-situ* photosensitive silver halide grains, it fails to teach the use or chemical sensitization of

a mixture of both preformed (*ex-situ*) and *in-situ* photosensitive silver halide grains. Rather, Morgan et al. actually teaches away from the use of preformed photosensitive silver halide grains (Col. 4, lines 7-22 and line 71 to Col. 5, line 4). Thus, it is inconceivable that a worker of ordinary skill in the art would combine the contradictory teachings of Winslow et al. and Morgan et al.

(2) No *prima facie* case for unpatentability has been made.

Moreover, even if combined, the references fail to support a *prima facie* rejection because there is nothing in any of the references to hint of Applicants' unique sequence of steps for making photothermographic emulsions and materials. Winslow et al. fails to teach or suggest: (1) use of a mixture of preformed and *in-situ* photosensitive silver halide grains along with (2) chemical sensitization after the *in-situ* photosensitive silver halide grains have been formed, and thus (3) chemical sensitization by decomposition of an organic sulfur-containing compound onto both types of photosensitive silver halide grains. Uytterhoeven et al. adds nothing to that taught in Winslow et al.

Morgan et al. states a strong preference for using *in-situ* photosensitive silver halide grains only. It does not suggest that the Winslow et al. method should be modified to use a mixture of the two types of photosensitive silver halide grains because it teaches away from the use of preformed grains. It also fails to teach chemical sensitization of any grains.

Nor are these deficiencies overcome by the teachings of Uytterhoeven et al. It also neglects to teach chemical sensitization of either type of silver halide grains by any process.

(3) Applicants have provided a showing of unexpected results.

Example 1 of the present application (pages 77-81) provides comparative data that is evidence of patentability over the teaching in the art (particularly Winslow et al.) with Inventive Examples 1-2a, 1-2b, 1-3, and 1-4). Control Example 1-1 was carried out using the procedure of Winslow et al. and the same chemical sensitizer. The sensitometric results obtained from these photothermographic materials are shown in TABLE I (page 81). The photospeeds (measured at two places on the Density vs. log E curve, SP-2 and SP-3) were unexpectedly increased using the method of the present invention compared to the method of the prior art. In the case of SP-2, the increases were 3%, 11%, 10%, and 9%, and for SP-3, the increases were 12%, 10%, 8%, and 9%, over the Control Example 1-1 (Winslow et al. method). Applicants' claimed method provided an unexpected increase in photospeed over the method of Winslow et al. using each of two different classes of organic sulfur-containing compounds. Thus, Applicants have demonstrated unexpected results over the teachings of the three references noted above.

Further evidence of unexpected results are provided by Example 2 of the present application (pages 81-83) in which the method of the presently claimed invention was carried out using either chemical sensitizer OSD-1, the merocyanine dye noted above (Inventive

Example 2-2) or a preferred diphenylphosphine sulfide (Inventive Example 2-3). The resulting sensitometric data are provided in TABLE II (page 83) in which it is evident that the method of the present invention provided increased SP-2 and SP-3 over the Control method with minimal change in Dmin.

The unpatentability rejection of Claims 6-8 over Winslow et al., Uytterhoeven et al., and Morgan et al. and U.S. Patent 3,895,951 (Riester et al.) is also improper.

(1) Riester et al. is non-analogous are and not properly combined with Winslow et al.

Riester et al. is non-analogous art. It is directed to photographic materials containing a silver halide, which materials are processed after exposure, using wet photographic processing solutions (e.g. Col. 17, lines 30-44). Nothing in Riester et al. hints of “dry-processed” photothermographic materials.

Riester et al. is not in the field of Applicants’ endeavor and is not reasonably pertinent to the particular problem with which the Applicants are concerned, *In re Oetiker* 24 U.S.P.Q.2d 1443, 1445 (Fed. Cir. 1992) and *In re Deminski* 230 U.S.P.Q. 313 (Fed. Cir. 1986). Also, Riester et al. is not a reference that, because of the matter with which it deals, logically would have commended itself to Applicants’ attention in considering a photospeed problem”, *Wang Laboratories Inv. v. Toshiba Corp.* 26 U.S.P.Q.2d 1767 (Fed. Cir. 1993).

The imaging arts have long recognized the differences between these two imaging systems and the unpredictable utility of photographic components in photothermographic materials because of the very different imaging chemistries, conditions, and retention or lack of retention of imaging chemistries in the imaged materials. The differences between photography and photothermography are outlined on pages 2-4 of the present application and references cited therein. The differences have necessitated separate classification in the USPTO as well as in other patent offices.

Since Riester et al. is directed to photographic emulsions, there is no discussion of the formation of *in-situ* photosensitive silver halide grains. Such grains are formed and used only in photothermographic emulsions since an organic silver salt must be present. The Final Rejection fails to address this critical deficiency in Riester et al.

While it might be “obvious to try” the Riester et al. compounds in photothermographic materials, without any reasonable expectation of success, merely trying the compounds in the photothermographic materials does not render such use unpatentable. Without motivation in the art in general or in Riester et al., it is not reasonably pertinent to find “new” chemical sensitizers to increase photospeed in photothermographic emulsions.

Therefore, Riester et al. fails the tests for “analogous” art. It is not in Applicant’s field of endeavor and it is not reasonably pertinent to the particular problem addressed by Applicants’ claimed invention.

(2) No *prima facie* case for unpatentability has been made.

Riester et al. is directed to the use of a wide variety of phosphine sulfides in photographic materials but only as “supersensitizers” for spectral sensitizing dyes (this is not chemical sensitization). They are used to enhance the performance of known spectral sensitizing dyes, and more conventional compounds are then used as chemical sensitizers (see Col. 1, lines 37-48; and Col. 15, line 69 to Col. 16, line 26, and Example 1). There is no suggestion of chemical sensitization by any type of compound let alone the phosphine sulfides.

Riester et al. also teaches that the phosphine sulfides can be added at any time in the preparation of a silver halide photographic emulsion (Col. 15, lines 16-24). There is no critical addition sequence or conditions for any type of emulsion let alone a photothermographic emulsion. This is in stark contrast to the present invention where sulfur-containing compounds must be added at a specific time and in an oxidizing environment in order to decompose the sulfur-containing compound and to chemically sensitize both the preformed (ex-situ) and in-situ photosensitive silver halide grains.

(3) Applicants have provided a showing of unexpected results.

The Examiner argues that the transposition of process steps or the splitting of one step into two where the processes are substantially identical or equivalent in term of function, manner and result renders Applicants’ invention *prima facie* obvious and does not patentably distinguish the process. *Ex parte Rubin* 128 USPQ 440, (PTO BdPatApp 1959). While a particular order of processing steps may seem obvious to the casual observer, any assumption of *prima facie* obviousness is rebutted with a showing of unexpected results, *In re Burhans* 154 F.2d 690, 69 USPQ 330 (CCPA 1946).

Applicants have provided those unexpected results. They have demonstrated that the use of diphenylphosphine sulfides in the method of the present invention provides unexpected results compared to the method of Winslow et al. and Riester et al. Applicants would point to the above discussion of the comparative results shown in Example 2. In particular, Inventive Example 2-3 provided a considerable increase in photospeed over Control Example 2-1 prepared according to Winslow et al. For SP-2, the increase in photospeed was 26% and for SP-3, the increase was 38%. Applicants’ method unexpectedly provided increased photospeed over the prior art method.

Further, Applicants would also refer to the previously submitted Rule 132 Declaration by Co-Applicant, Dr. Sharon Simpson, providing additional evidence of unexpected results. From the data provided in copending U.S. Serial No. 10/731,251, not just any phosphine sulfide provides increased photospeed. This demonstrates that Applicants’ choice in phosphine sulfide structure is critical to increased photospeed.

The unpatentability rejection of Claim 16 over Winslow et al., Uytterhoeven et al., Morgan et al. and U.S. Patent 6,440,649 (Simpson et al.) is in error for the same reasons stated above. Nothing in Simpson et al. overcomes the deficiencies in the other three references.

The unpatentability rejection of Claims 17-22 over Winslow et al., Uytterhoeven et al., Morgan et al., and Riester et al. is also in error for the same reasons presented above with regard to Claims 6-8.

The obviousness-type double patenting rejection of Claims 1-27 over Claims 1-19 of Winslow et al. taken with the cited publications has no more merit than the rejection of those claims over the specification of Winslow et al. with the cited art.

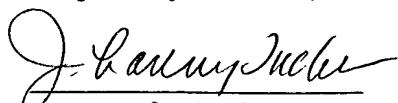
The obviousness-double patenting rejection of Claims 1-27 over Claims 1-27 of pending and commonly assigned U.S. Serial No. 10/731,462 (Burleva et al.) having a common filing date with the present application is also incorrect. The Final Rejection argues that “[a] lthough the conflicting claims are not identical, they are not patentably distinct from each other because the claims contain similar steps and the same sulfur containing compound”. Applicants disagree.

Both claimed inventions are methods for preparing photothermographic emulsions and materials. That much is common with both inventions. With respect to the sulfur-containing compounds, the compounds used in the copending application are only some of the preferred sulfur-containing compounds useful in the presently claimed invention. More importantly, however, the claims of the present application require a unique, critical sequence of steps that are patentably distinct. Nothing in the copending claims suggests that a mixture of both preformed and *in-situ* photosensitive silver halide grains is to be prepared, or that such mixture is to be prepared before chemical sensitization using organic sulfur-containing compounds. Applicants' presently claimed invention provides chemical sensitization of both types of compounds not just one type.

It is believed that the foregoing is a complete response to the Final Rejection on all issues and that the present application should be passed to issue. A Notice of Appeal is being filed herewith.

Respectfully submitted,

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